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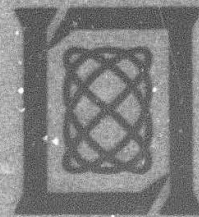
**Lincoln Laboratory**

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**UNCLASSIFIED PUBLICATIONS  
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**VOLUME 5**

15 December 1975



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A handwritten signature in dark ink, appearing to read "William H. Lawton". The signature is fluid and cursive, with the first name "William" and last name "Lawton" clearly distinguishable.

William H. Lawton, Lt. Col., USAF

Acting Chief, ESD Lincoln Laboratory Project Office

## **FOREWORD**

**Volume 5 of Unclassified Publications of Lincoln Laboratory lists reports published from 15 December 1973 to 15 December 1975, as well as updated information on earlier publications.**

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### ADVANCED ELECTRONIC TECHNOLOGY

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|------------------|----------------|------------------|----------------|
| 15 February 1974 | AD-777154/6    | 15 February 1975 | AD-A008503/5   |
| 15 May 1974      | AD-781380/1    | 15 May 1975      | AD-A012734/0   |
| 15 August 1974   | AD-787882/0    | 15 August 1975   | AD-A016399/8   |
| 15 November 1974 | AD-A002877/9   | 15 November 1975 | AD-A020959/3   |

### ATC SURVEILLANCE/COMMUNICATION ANALYSIS AND PLANNING

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|--------------|----------------|-------------|----------------|
| 1 March 1974 | AD-779556/0    | 1 June 1974 | AD-783184/5    |

### DEVELOPMENT OF A DISCRETE ADDRESS BEACON SYSTEM

|                | <u>DDC No.</u> |                | <u>DDC No.</u> |
|----------------|----------------|----------------|----------------|
| 1 January 1974 | AD-776118/2    | 1 January 1975 | AD-A007060/7   |
| 1 April 1974   | AD-781326/4    | 1 April 1975   | AD-A010441/4   |
| 1 July 1974    | AD-786272/5    | 1 July 1975    | AD-A014090/5   |
| 1 October 1974 | AD-A002399/4   | 1 October 1975 | AD-A019246/8   |

### EDUCATIONAL TECHNOLOGY PROGRAM

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| 15 June 1974      | AD-782422/0    | 15 March 1975    | AD-A008502/7   |
| 15 September 1974 | AD-A001244/3   | 15 June 1975     | AD-A014255/4   |

## NAVY COMMUNICATIONS

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| 15 April 1974   | AD-919549-L    | 15 April 1975   | AD-B004671-L   |
| 15 July 1974    | AD-922522-L    | 15 July 1975    | AD-B007020-L   |
| 15 October 1974 | AD-B000840-L   | 15 October 1975 | AD-B008722-L   |

## SPACE COMMUNICATIONS

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| 15 June 1974      | AD-921457-L    | 15 June 1975      | AD-B006105-L   |
| 15 September 1974 | AD-B000322-L   | 15 September 1975 | AD-B007714-L   |
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## QUARTERLY REPORTS

## SOLID STATE RESEARCH

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| 1973:4 | AD-778086/9    | 1974:4 | AD-A004763/9   |
| 1974:1 | AD-779823/4    | 1975:1 | AD-A009848/3   |
| 1974:2 | AD-783634/9    | 1975:2 | AD-A013103/7   |
| 1974:3 | AD-A001595/8   | 1975:3 | AD-A019472/0   |

## SEMIANNUAL TECHNICAL SUMMARY REPORTS

### INFORMATION PROCESSING TECHNIQUES (Packet Speech/Acoustic Convolvers)

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| 31 December 1974 | AD-A024999     | 30 June 1975 | AD-A025000     |

### INTEGRATED OPTICAL CIRCUITS

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| 30 June 1974     | AD-A006813/0   | 30 June 1975     | AD-A022695     |

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| 31 December 1973 | AD-777151/2    | 31 December 1974 | AD-A006194/5   |
| 30 June 1974     | AD-785377/3    | 30 June 1975     | AD-A014793/4   |

### SOLID ELECTROLYTES AND PHOTOELECTROLYSIS

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| 31 May 1974 | AD-783284/3    |

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|---------------|--|---|---------------|---|
| 83            | 18-Mcps Field-Strength Measurements over Sea Water   | S. J. Fricker<br>R. P. Ingalls<br>W. T. Quinn<br>M. L. Stone<br>C. A. Stutt | 14 June 1955  | AD-76455                                  |
| 492           | An Experimental ELF Receiver   | S. L. Bernstein<br>D. A. McNeil<br>O. G. Nackoney<br>I. Richer              | 11 Sept. 1973 | AD-776796/5                               |
| 496           | Load Impedance Characteristics of TRAPATT Oscillators  | J. D. Welch   | 9 July 1973   | AD-776773/4                               |
| 501           | Compensation of Multipath Angular Tracking Errors in Radar   | I. Kupiec   | 20 Mar. 1974  | AD-781100/3                               |
| 502           | Magnetic Moment Versus Temperature Curves of LiZnTi Ferrites   | G. F. Dionne  | 10 May 1974   | AD-782421/2                               |
| 508           | Millstone Hill Radar Propagation Study: Calibration  | J. V. Evans,<br>Editor  | 5 Oct. 1973   | AD-779689/9                               |
| 509           | Millstone Hill Radar Propagation Study: Scientific Results -<br>Part I<br>Part II<br>Part III                | J. V. Evans,<br>Editor  | 13 Nov. 1973  | AD-781179/7<br>AD-782748/8<br>AD-780519/5 |
| 510           | The Bulk Filtering, Acquisition and Tracking System (BATS)   | C. M. Steinmetz   | 2 Oct. 1973   | AD-781101/1                               |
| 511           | Energy Dissipation by Electron Beam Scattering in Thin Polymer Films   | R. J. Hawryluk  | 11 Nov. 1974  | AD-A007061/5                              |
| 512           | Radio-Frequency Interference from Linear-FM Pulses   | J. J. G. McCue  | 16 July 1974  | AD-A003677/2                              |
| 513           | Millstone Hill Thomson Scatter Results for 1969  | J. V. Evans   | 23 July 1974  | AD-A008505/0                              |
| 514           | Unified Model of the Insulator-Metal Transition in $Ti_2O_3$ and the High-Temperature Transition in $V_2O_3$ | H. J. Zeiger  | 22 Aug. 1974  | AD-A001546/1                              |
| 515           | Lincoln Laboratory LTS-3S Training System: Application to Teaching Essential Mining Skills                   | W. P. Harris<br>R. E. Rodgers   | 15 July 1975  |   |

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| 1973-11            | Accuracy Limitations of Hyperbolic Multilateration Systems  | H. B. Lee  | 22 Mar. 1973 | PB-219606/1    |
| 1973-36,<br>Rev. 1 | An Introduction to the Mathematics of Linear Predictive Filtering as Applied to Speech Analysis and Synthesis | E. M. Hofstetter   | 12 Apr. 1974 | AD-777579/4    |
| 1973-43            | Accuracy Limitations of Range-Range (Spherical) Multilateration Systems                                       | H. B. Lee  | 11 Oct. 1973 | PB-228135/0    |
| 1974-1             | Design of an Autonomous Stationkeeping Controller for LES-8/9   | S. Srivastava<br>R. W. Brockett  | 21 Feb. 1974 | AD-775144/9    |
| 1974-2             | Review of High-Reliability Procurement Practices in the Semiconductor Industry                                | A. G. Stanley  | 11 Jan. 1974 | AD-773833/9    |
| 1974-4             | Designing Algorithms for Exo-atmospheric Discrimination   | B. J. Burdick<br>G. L. Carayannopoulos<br>W. H. Schoendorf<br>C. W. Therrien | 16 Jan. 1974 | AD-773834/7    |
| 1974-5             | Doubly Averaged Effect of the Moon and Sun on a High Altitude Earth Satellite Orbit                           | M. E. Ash  | 1 Mar. 1974  | AD-776022/6    |
| 1974-7             | Models of Multipath Propagation Effects in a Ground-to-Air Surveillance System                                | T. P. McGarty  | 25 Feb. 1974 | AD-777241/1    |
| 1974-8             | Perturbation of a Synchronous Satellite Due to Geopotential   | S. Srivastava  | 1 Feb. 1974  | AD-774548/2    |
| 1974-9             | Closed Loop Testing of LES-8/9 Autonomous Stationkeeping System   | S. Srivastava<br>W. A. Petersen<br>F. S. Zimnoch<br>W. B. Smith              | 25 Oct. 1974 | AD-A002315/0   |
| 1974-12            | False Target Elimination at Albuquerque Using ARTS-III Software   | A. G. Cameron  | 12 Mar. 1974 | AD-776798/1    |
| 1974-13            | On the Estimation of the Arrival Time of Pulse Signals in Gaussian Noise                                      | R. S. Orr<br>R. D. Yates   | 26 Aug. 1974 | PB-236768/8    |
| 1974-14            | International Seismic Month Event List  | R. T. Lacoss<br>R. E. Needham<br>B. R. Julian                                | 27 Feb. 1974 | AD-776021/8    |
| 1974-15            | Long Period Results from the International Seismic Month  | J. R. Filson   | 4 Mar. 1974  | AD-776089/5    |

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| 1974-17       | Principle of Dynamic Equipollency and the Limitations of the Inverse Eigenvalue Method of Mechanical Admittance Analysis   | R. L. Bagley                                | 4 Mar. 1974  | AD-776797/3    |
| 1974-18       | A Simple Technique for Recording Optical Signatures  | W. E. Krag<br>R. Sridharan<br>A. J. Yakutis | 20 Mar. 1974 | AD-777152/0    |
| 1974-19       | UHF Fading from a Synchronous Satellite Observed at Kwajalein October 1970 Through June 1972   | B. E. Nichols                               | 22 Mar. 1974 | AD-780174/9    |
| 1974-20       | Visual Magnitude Flux Rate Density Standards for Sunlight Incident on Photoemissive Surfaces   | R. Weber                                    | 6 May 1974   | AD-779822/6    |
| 1974-21       | The Limits of Detectability of a Low-Light-Level Point-Source Sensor as a Function of Telescope Aperture, Sensor Resolution, Night-Sky Background, and Pre-readout Electron Gain | R. Weber<br>T. H. Brooks                    | 16 Aug. 1974 | AD-785137/1    |
| 1974-22       | Ballistic Vehicle LWIR Signature Predictions   | B. W. Bryant<br>D. M. Edwards<br>R. J. Hull | 10 May 1974  | AD-779688/1    |
| 1974-23       | Visible Magnitude of Typical Satellites in Synchronous Orbits  | W. E. Krag                                  | 6 Sept. 1974 | AD-785380/7    |
| 1974-25       | A Digital Spectral Limiter for Asynchronous Multiple-Access Satellite Communication  | B. E. White                                 | 8 Aug. 1974  | AD-A000425/9   |
| 1974-26       | Star-Satellite Processor Using Video Disc  | G. T. Flynn                                 | 26 Apr. 1974 | AD-778831/8    |
| 1974-27       | ELF Antenna Flow Test Facility   | S. E. Forman                                | 23 Apr. 1974 | AD-778832/6    |
| 1974-28       | Tracking Error Analysis for Satellite Surveillance Systems   | C. J. Kurys<br>W. J. Steinway               | 29 Apr. 1974 | AD-779918/2    |
| 1974-29       | Morphology of Ionospheric Scintillation  | R. K. Crane                                 | 21 May 1974  | AD-780522/9    |
| 1974-30       | The ALTAIR Tracking Algorithms   | H. B. Brooks                                | 18 June 1974 | AD-783285/0    |
| 1974-32       | The Design of Multiple Access Frequency Hopping Patterns   | R. M. Mersereau<br>T. S. Seay               | 6 Sept. 1974 | AD-785381/5    |
| 1974-33       | Electron Beam Induced Degradation in ELS Diodes  | W. E. Krag                                  | 20 May 1974  | AD-780521/1    |

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| 1974-34       | Physical Limitations on Interference Reduction by Antenna Pattern Shaping   | J. T. Mayhan<br>L. J. Ricardi  | 19 June 1974  | AD-782229/9    |
| 1974-35       | A Low-Sidelobe Antenna-Radome Study at K <sub>a</sub> -Band   | J. T. Mayhan<br>A. J. Simmons  | 27 June 1974  | AD-785138/9    |
| 1974-36       | A Tentative Design for LES-10   | B. Reiffen<br>L. J. Ricardi<br>L. W. Bowles<br>B. H. Hutchinson<br>C. W. Niessen<br>F. W. Floyd<br>D. E. Weidler | 3 June 1974   | AD-919548-L    |
| 1974-37       | Optimum Detectors of Pseudo-noise Waveforms   | S. L. Bernstein  | 19 June 1974  | AD-781800/8    |
| 1974-38       | Digital Aircraft Communications with Emphasis on Satellites   | L. M. Goodman  | 30 May 1974   | AD-921085-L    |
| 1974-39       | Fabrication of Electron-Bombarded Semiconductor (EBS) Diodes  | B. E. Burke<br>R. A. Cohen<br>R. W. Mountain   | 29 July 1974  | AD-784856/7    |
| 1974-40       | Frequency Choice for Tactical Satellite Communications  | K. S. Schneider  | 22 July 1974  | AD-783912/9    |
| 1974-41       | Eigenvalue Properties of Projection Operators and Their Application to the Subspace Method of Feature Extraction            | C. W. Therrien   | 15 Aug. 1974  | AD-784863/3    |
| 1974-44       | Some Techniques for Testing Pseudo-Random Number Sequences  | J. L. Mannos   | 21 Aug. 1974  | AD-785379/9    |
| 1974-51       | Computer Code Used in Monte Carlo Calculations of the Energy Dissipation in a Thin Polymer Film by Electron Beam Scattering | A. M. Hawryluk<br>R. J. Hawryluk   | 13 Sept. 1974 | AD-786809/4    |
| 1974-52       | Helically Wound Permalloy Tape Cores for ELF Antennas   | M. L. Burrows  | 21 Nov. 1974  | AD-A002316/8   |
| 1974-54       | The LES-8/9 UHF Downlink Code   | D. B. Coomber<br>G. G. Lias<br>T. S. Seay<br>E. Weiss  | 12 Dec. 1974  | AD-A003680/6   |
| 1974-56       | Intermodulation Products of a UHF Diplexer  | J. C. Lee  | 21 Oct. 1974  | AD-A001583/4   |

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| 1974-58,<br>Vols. 1<br>& 2 | Digital Signal Processor Designs for Radar Applications  | R. J. Purdy<br>P. E. Blankenship<br>A. E. Filip<br>J. M. Frankovich<br>A. H. Huntoon<br>J. H. McClellan<br>J. L. Mitchell<br>V. J. Sferrino | 31 Dec. 1974 | AD-B001419-L<br>(Vol. 1)<br>AD-B001420-L<br>(Vol. 2) |
| 1974-59                    | A Generalized Approach to Linear Methods of Feature Extraction                                       | C. W. Therrien  | 30 Dec. 1974 | AD-A004212/7   |
| 1975-1                     | Spacecraft Self-Contamination by Molecular Outgassing  | R. L. Harvey  | 31 Mar. 1975 | AD-A008504/3   |
| 1975-3                     | Some Characteristics of a Communication Satellite Multiple-Beam Antenna                              | L. J. Ricardi<br>A. J. Simmons<br>A. R. Dion<br>L. K. DeSize<br>B. M. Potis   | 28 Jan. 1975 | AD-A006405/5   |
| 1975-4                     | Phase-Delay-Type Artificial Dielectrics  | L. L. Tsai  | 17 Jan. 1975 | AD-A005687/9   |
| 1975-5                     | A Preliminary Design of a TDMA System for FLEETSAT   | J. D. Bridwell<br>I. Richer   | 12 Mar. 1975 | AD-A007823/8   |
| 1975-6                     | Effects of Local Terrain and Obstacles Upon Near Horizon Gain of L-Band Beacon Antennas              | A. Spiridon   | 17 July 1975 | AD-A013732/3   |
| 1975-7                     | High Resolution Spectral Estimates   | L. C. Pusey   | 21 Jan. 1975 | AD-A006406/3   |
| 1975-8                     | Preliminary Investigation of Digital Speech Processor Hardware Implementations                       | P. E. Blankenship   | 5 Feb. 1975  | AD-A007062/3   |
| 1975-10                    | UHF Satellite Communication During Scintillation   | E. A. Bucher  | 5 Aug. 1975  | AD-A014801/5   |
| 1975-11                    | The Statistical Characteristics of Diffuse Multipath Radiation and Its Effect on Antenna Performance | T. P. McGarty   | 25 Mar. 1975 | AD-A009869/9   |
| 1975-13                    | LO - A Text Formatting Program   | A. Evans, Jr.   | 21 Feb. 1975 | AD-A007824/6   |
| 1975-14                    | The ARIES Program: A General Overview and Users' Guide   | M. E. Austin  | 10 Dec. 1975 | AD-A020807/4   |
| 1975-15                    | The ARIES Program: Coordinates, Transformations, Trajectories and Tracking                           | B. L. Diamond<br>M. E. Austin   | 5 Sept. 1975 | AD-A015815/4   |

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| 1975-16       | The ARIES Program: Analysis and Generation of Simulated Radar Measurements                         | J. L. Mannos<br>J. L. Katz  | 9 July 1975  | AD-A013734/9   |
| 1975-18       | Hardware for the Fermat Number Transform   | J. H. McClellan   | 1 Apr. 1975  | AD-A009144/7   |
| 1975-19       | Performance of the ELF Antenna Water-Flow Tunnel   | M. L. Burrows   | 27 May 1975  | AD-A011947/9   |
| 1975-20       | Applications of the Principle of Dynamic Equipollency to Mechanical Admittance Testing             | R. L. Bagley  | 10 Mar. 1975 | AD-A011713/5   |
| 1975-21       | Losses in a Periodically Gapped Cable Armor in Contact with the Surrounding Soil                   | M. L. Burrows   | 25 Apr. 1975 | AD-A010592/4   |
| 1975-22       | Strain-Gage Vibration Measurements on a Submarine-Towed Antenna Cable                              | M. L. Burrows   | 27 May 1975  | AD-A012287/9   |
| 1975-23       | Computer Assisted Instruction; Some Techno-Economic Factors  | R. C. Butman  | 1 Apr. 1975  | AD-A008802/1   |
| 1975-24       | The Lincoln Submarine-Towed ELF Loop Antenna   | M. L. Burrows   | 27 May 1975  | AD-B004869-L   |
| 1975-25       | Radiation Pattern Calculations for a Waveguide Lens Multiple-Beam Antenna Operating in the AJ Mode | B. M. Potts   | 14 Oct. 1975 | AD-A020167/3   |
| 1975-26       | A Bandwidth Conserving Approach to Multiple Access Satellite Communication for Mobile Terminals    | B. E. White<br>R. M. Mersereau  | 17 Dec. 1975 | AD-A022556     |
| 1975-27       | Capacitive Profile Tapering for Towed ELF Loop Antennas  | M. L. Burrows   | 27 May 1975  | AD-A011980/0   |
| 1975-28       | Ionospheric Limitations on Radar Accuracy at L-Band  | R. H. Wand  | 27 May 1975  | AD-A013731/5   |
| 1975-29       | Experimental Validation of PALM - A System for Precise Aircraft Location                           | J. E. Evans<br>D. Karp<br>R. R. LaFrey<br>R. J. McAulay<br>I. G. Stiglitz | 29 Apr. 1975 | AD-A010112/1   |
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| 1975-31       | Coherent Overlaying - A Signature Enhancement Processing Technique                                 | L. B. Spence  | 5 May 1975   | AD-A010477/8   |

**Technical Notes**

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| 1975-32       | Error Analysis of a Variable-Power Divider  | L. J. Ricardi                | 9 June 1975   | AD-A011949/5   |
| 1975-33       | Measurements of ELF Noise Processing  | A. S. Griffiths              | 2 Sept. 1975  | AD-A016477/2   |
| 1975-34       | On the Close Packing of Unsynchronized FDM Waveforms  | B. E. White                  | 14 Oct. 1975  | AD-A021412/2   |
| 1975-35       | Evaluation of Probability of Detection for Several Target Fluctuation Models  | D. A. Shnidman               | 8 July 1975   | AD-A013733/1   |
| 1975-36       | Observations of Synchronous Satellite ATS-3 with Three Coherent Radars  | L. B. Spence<br>G. P. Banner | 9 June 1975   | AD-A013105/2   |
| 1975-37       | Summary of Radiation Pattern Measurements Using the LES-7 Lens and Variable Power Dividing (VPD) Feed Network at 7.68 GHz | B. M. Potts                  | 27 May 1975   | AD-A011946/1   |
| 1975-38       | Measured Characteristics of Variable Power Dividers   | L. K. DeSize                 | 27 May 1975   | AD-A012288/7   |
| 1975-39       | Optimization of a Communication Satellite Multiple-Beam Antenna   | A. R. Dion                   | 27 May 1975   | AD-A013104/5   |
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| 1975-41       | Confidence Intervals for Regression (MEM) Spectral Estimates  | A. B. Baggeroer              | 18 June 1975  | AD-A012286/1   |
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| 1975-45       | Experimental Verification of the Performance of the Aperture Sampling Technique   | I. Kupiec                    | 15 Sept. 1975 | AD-A016779/1   |
| 1975-46       | Radiation Properties of a Spherical Array Designed for Low Sidelobes  | J. T. Mayhan                 | 30 Sept. 1975 | AD-A017278/3   |

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| 1975-49            | Printed-Circuit RF-Keyed Crossed-Field Amplifier  | W. E. Courtney   | 25 Nov. 1975  | AD-A020119/4   |
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| 1975-53            | The Lincoln Digital Voice Terminal System   | P. E. Blankenship<br>E. M. Hofstetter<br>A. H. Huntoon<br>M. L. Malpass<br>S. Seneff<br>V. J. Sferrino | 25 Aug. 1975  | AD-A017569/5   |
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| 4415 | On the Wigner Distribution Function for an Oscillator  | R. W. Davies<br>K. T. R. Davies   | Ann. Phys. <u>89</u> , 261 (1975)  |
| 4416 | Band Structure of CdGeAs <sub>2</sub> Near $\bar{k} = 0$   | H. Kildal   | Phys. Rev. B <u>10</u> , 5082 (1974),<br>DDC AD-A007761/0                                  |
| 4417 | InAs Spin-Flip Laser Operation at 3 $\mu\text{m}$  | R. S. Eng<br>A. Mooradian<br>H. R. Fetterman                                    | Appl. Phys. Lett. <u>25</u> , 453 (1974),<br>DDC AD-A008306/3                              |
| 4418 | Doppler-Limited Spectra of the $\nu_3$ Vibration of $^{12}\text{CH}_4$ and $^{13}\text{CH}_4$                    | A. S. Pine  | J. Mol. Spectrosc. <u>54</u> , 132 (1975)  |

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| 4419 | Tunable Semiconductor Diode Lasers and Applications   | I. Melngailis<br>A. Mooradian   | Chapter in <u>Laser Applications to Optics and Spectroscopy</u> , S. Jacobs, M. Sargent, III, J. F. Scott, and M. O. Scully, Eds. (Addison Wesley, Reading, Massachusetts, 1975), p. 1 |
| 4420 | A Study of F2 Region Daytime Vertical Ionization Fluxes at Millstone Hill During 1969   | J. V. Evans   | Planet. Space Sci. <u>23</u> , 1461 (1975), DDC AD-A024177   |
| 4421 | Nonchemical HF Pulse Laser Pumped by e-Beam-Sustained Discharge   | R. M. Osgood, Jr.<br>D. L. Mooney   | Appl. Phys. Lett. <u>26</u> , 201 (1975), DDC AD-A008305/5   |
| 4422 | Submillimeter Heterodyne Detection and Harmonic Mixing Using Schottky Diodes  | H. R. Fetterman<br>B. J. Clifton<br>P. E. Tannenwald<br>C. D. Parker<br>H. Penfield | IEEE Trans. Microwave Theory Tech. <u>MTT-22</u> , 1013 (1974), DDC AD-A011324/1   |
| 4424 | Electroabsorption Avalanche Photodiodes   | G. E. Stillman<br>C. M. Wolfe<br>J. A. Rossi<br>J. P. Donnelly                      | Appl. Phys. Lett. <u>25</u> , 671 (1974), DDC AD-A006705/8   |
| 4427 | Submillimeter-Wave Optically-Pumped Molecular Lasers  | H. R. Fetterman<br>H. R. Schlossberg  | Microwave J. <u>17</u> , 35 (1974)   |
| 4429 | Effects of Cesium on Secondary-Electron Emission from MgO/Au Cermets  | V. E. Henrich<br>J. C. C. Fan   | J. Appl. Phys. <u>45</u> , 5484 (1974), DDC AD-A008304/8   |
| 4431 | Transparent Heat-Mirror Films of TiO <sub>2</sub> /Ag/TiO <sub>2</sub> for Solar Energy Collection and Radiation Insulation   | J. C. C. Fan<br>F. J. Bachner<br>G. H. Foley<br>P. M. Zavracky                      | Appl. Phys. Lett. <u>25</u> , 693 (1974), DDC AD-A007892/3   |
| 4432 | Auger Spectroscopy Studies of the Oxidation of Amorphous and Crystalline Germanium  | V. E. Henrich<br>J. C. C. Fan   | J. Appl. Phys. <u>46</u> , 1206 (1975), DDC AD-A013949/3   |
| 4433 | Modifications to Formant Tracking Algorithm of April 1974   | S. Seneff   | Accepted IEEE Trans. Acoust., Speech, and Signal Processing  |
| 4435 | Impulsive Loading of Targets by HF Laser Pulses   | S. Marcus<br>J. E. Lowder   | J. Appl. Phys. <u>46</u> , 2293 (1975), DDC AD-A016691/8   |
| 4437 | Double Heterostructure Pb <sub>1-x</sub> Sn <sub>x</sub> Te Waveguides at 10.6 $\mu$ m  | R. W. Ralston<br>J. N. Walpole<br>T. C. Harman<br>I. Melngailis                     | Appl. Phys. Lett. <u>26</u> , 64 (1975), DDC AD-A007894/9  |
| 4438 | Crystal Structure and Fluorescence Lifetime of NdAl <sub>3</sub> (BO <sub>3</sub> ) <sub>4</sub> , a Promising Laser Material | H. Y-P. Hong<br>K. Dwight   | Mater. Res. Bull. <u>9</u> , 1661 (1974), DDC AD-A006704/1   |

# Journal Articles

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| 4440 | Simplified Matrix Inversion for Optimization of Linear Arrays  | M. Y. L. Liu<br>H. J. Stalzer, Jr.  | Accepted IEEE Trans. Antennas Propag.                                       |
| 4442 | Optically Pumped Vibrational Transition Laser in OCS   | H. R. Schlossberg<br>H. R. Fetterman  | Appl. Phys. Lett. <u>26</u> , 316 (1975),<br>DDC AD-A011318/3               |
| 4443 | Frequency Stabilization and Absolute Frequency Measurements of a cw HF/DF Laser  | R. S. Eng<br>D. L. Spears   | Appl. Phys. Lett. <u>27</u> , 650 (1975),<br>DDC AD-A024238                 |
| 4444 | FIR Digital Filter Design Techniques Using Weighted Chebyshev Approximation  | L. R. Rabiner<br>J. H. McClellan<br>T. W. Parks                             | Proc. IEEE <u>63</u> , 595 (1975)   |
| 4445 | The Influence of Stored Energy at Step Discontinuities on the Behavior of Surface-Wave Gratings  | R. C. M. Li<br>J. Melngailis  | IEEE Trans. Sonics Ultrason. <u>SU-22</u> , 189 (1975),<br>DDC AD-A016700/7 |
| 4446 | The Static Deformation of an Earth with a Fluid Core: A Physical Approach  | M. A. Chinnery  | Geophys. J. R. Astr. Soc. <u>42</u> , 461 (1975), DDC AD-A024174            |
| 4447 | High Resolution Q-Branch Spectrum of CO <sub>2</sub> at 618 cm <sup>-1</sup>   | J. P. Aldridge<br>R. F. Holland<br>H. Flicker<br>K. W. Nill<br>T. C. Harman | J. Mol. Spectrosc. <u>54</u> , 328 (1975)                                   |
| 4449 | Heterodyne Measurements of <sup>12</sup> C <sup>18</sup> O, <sup>13</sup> C <sup>16</sup> O, and <sup>13</sup> C <sup>18</sup> O Laser Frequencies; Mass Dependence of Dunham Coefficients | A. H. M. Ross<br>R. S. Eng<br>H. Kildal                                     | Opt. Commun. <u>12</u> , 433 (1974)   |
| 4450 | Tidal Effects in the E Region from Incoherent Scatter Radar Observations   | J. E. Salah<br>R. H. Wand<br>J. V. Evans                                    | Radio Sci. <u>10</u> , 347 (1975)   |
| 4451 | Dielectric Constants of Paraffin-Wax - TiO <sub>2</sub> Mixtures   | G. F. Dionne<br>J. F. Fitzgerald<br>R. C. Aucoin                            | Accepted J. Appl. Phys.   |
| 4452 | Planar InSb Photodiodes Fabricated by Be and Mg Ion Implantation   | C. E. Hurwitz<br>J. P. Donnelly   | Solid-State Electron. <u>18</u> , 753 (1975), DDC AD-A016705/6              |
| 4453 | Etude des Proprietes Magnetiques, Electriques et Optiques des Phases de Structure Perovskite SrVO <sub>2,90</sub> et SrVO <sub>3</sub>   | P. Douglar<br>J. C. C. Fan<br>J. B. Goodenough                              | J. Solid State Chem. <u>14</u> , 247 (1975)                                 |
| 4454 | Optically Pumped cw InSb Lasers for NO Spectroscopy  | A. S. Pine<br>N. Menyuk   | Appl. Phys. Lett. <u>26</u> , 231 (1975)                                    |
| 4455 | Axial Astigmatic Fields in the Focal Region  | J. Ruze   | IEEE Trans. Antennas Propag. <u>AP-23</u> , 734 (1975),<br>DDC AD-A024237   |

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| 4456  | Light Scattering Lineshape in Opaque Materials                                    | G. Dresselhaus<br>A. S. Pine                                 | Solid State Commun. <b>16</b> , 1001 (1975), DDC AD-A013948/5            |
| 4457  | Spacecraft Self-Contamination by Molecular Outgassing                             | R. L. Harvey   | Accepted J. Spacecraft   |
| 4458  | Physical Limitations on Interference Reduction by Antenna Pattern Shaping         | J. T. Mayhan<br>L. J. Ricardi                                | IEEE Trans. Antennas Propag. <b>AP-23</b> , 639 (1975), DDC AD-A017357/5 |
| 4459  | Screening by Fixed Charges in Compensated Semiconductors                          | D. M. Larsen   | Phys. Rev. B <b>11</b> , 3904 (1975), DDC AD-A013947/7                   |
| 4460  | Evidence for Localized Excitations in MgO from Electron Energy-Loss Spectroscopy  | V. E. Henrich<br>G. Dresselhaus                              | Solid State Commun. <b>16</b> , 1117 (1975), DDC AD-A013951/9            |
| 4461  | External Cavity CO <sub>2</sub> -Pumped InSb Spin-Flip Laser                      | S. R. J. Brueck<br>A. Mooradian                              | Accepted IEEE J. Quantum Electron.                                       |
| 4463  | On the Tectonics of Asia  | S. Das<br>J. Filson  | Earth Planet. Sci. Lett. <b>28</b> , 241 (1975), DDC AD-A024180          |
| 4464  | Fabrication of Silicon MOS Devices Using X-Ray Lithography                        | S. E. Bernacki<br>H. I. Smith                                | IEEE Trans. Electron Devices <b>ED-22</b> , 421 (1975), DDC AD-A016697/5 |
| 4465  | Molecular Absorption of Infrared Laser Radiation in the Natural Atmosphere        | P. L. Kelley<br>R. A. McClatchey<br>R. K. Long<br>A. Snelson | Accepted Opt. Quantum Electron.  |
| 4469  | Low-Threshold, Transversely Excited NdP <sub>5</sub> O <sub>14</sub> Laser        | S. R. Chinn<br>J. W. Pierce<br>H. Heckscher                  | IEEE J. Quantum Electron. <b>QE-11</b> , 747 (1975), DDC AD-A017355/9    |
| 4469A | Low-Threshold, Transversely Excited NdP <sub>5</sub> O <sub>14</sub> Laser        | S. R. Chinn<br>J. W. Pierce<br>H. Heckscher                  | Accepted Appl. Opt.  |
| 4471  | Origin of Secondary-Electron-Emission Yield-Curve Parameters                      | G. F. Dionne   | J. Appl. Phys. <b>46</b> , 3347 (1975), DDC AD-A016698/3                 |
| 4472  | Energy Dissipation in a Thin Polymer Film by Electron Beam Scattering: Experiment | R. J. Hawryluk<br>H. I. Smith<br>A. Soares<br>A. M. Hawryluk | J. Appl. Phys. <b>46</b> , 2528 (1975), DDC AD-A016692/6                 |
| 4473  | Low-Threshold cw LiNdP <sub>4</sub> O <sub>12</sub> Laser                         | S. R. Chinn<br>H. Y-P. Hong                                  | Appl. Phys. Lett. <b>26</b> , 649 (1975), DDC AD-A016708/0               |
| 4475  | Evidence for Earthquake Triggering Stress   | M. A. Chinnery<br>T. E. Landers                              | Nature <b>258</b> , 490 (1975), DDC AD-A024230                           |
| 4476  | Efficient InSb Laser with Resonant Longitudinal Optical Pumping                   | N. Menyuk<br>A. S. Pine<br>A. Mooradian                      | IEEE J. Quantum Electron. <b>QE-11</b> , 477 (1975)                      |

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| 4477 | 10.6- $\mu$ m FM-Chirp Radar Using Narrow-Band Correlation Detection               | W. E. Bicknell<br>L. R. Tomasetta<br>R. H. Kingston        | IEEE J. Quantum Electron. <u>QE-11</u> , 308 (1975), DDC AD-A016706/4    |
| 4478 | Synthesis of Equiripple Sector Antenna Patterns                                    | J. E. Evans  | Accepted IEEE Trans. Antennas Propag.                                    |
| 4479 | Vertical Transport Coefficients in the Mesosphere Obtained from Radar Observations | D. M. Cunnold  | J. Atmos. Sci. <u>32</u> , 2191 (1975), DDC AD-A024181                   |
| 4481 | Observation of a Very Narrow Surface Resonance on Single-Crystal Aluminum          | V. E. Henrich  | Surf. Sci. <u>49</u> , 675 (1975), DDC AD-A016707/2                      |
| 4482 | Spectra of Ionospheric Scintillation   | R. K. Crane  | Accepted J. Geophys. Res.  |
| 4485 | Attenuation due to Rain - A Mini-Review  | R. K. Crane  | IEEE Trans. Antennas Propag. <u>AP-23</u> , 750 (1975), DDC AD-A017358/3 |
| 4487 | Properties of Sn-Doped $\text{In}_2\text{O}_3$ Films Prepared by RF Sputtering     | J. C. C. Fan<br>F. J. Bachner                              | J. Electrochem. Soc. <u>122</u> , 1719 (1975), DDC AD-A024234            |
| 4488 | Optically Pumped 15.90 $\mu$ m $\text{SF}_6$ Laser                                 | W. E. Barch<br>H. R. Fetterman<br>H. R. Schlossberg        | Opt. Commun. <u>15</u> , 358 (1975), DDC AD-A024182                      |
| 4489 | A Schottky-Diode Acoustic Memory and Correlator                                    | K. A. Ingebrigtsen<br>R. A. Cohen<br>R. W. Mountain        | Appl. Phys. Lett. <u>26</u> , 596 (1975), DDC AD-A016703/1               |
| 4491 | A Study of F2 Region Night-Time Vertical Ionization Fluxes at Millstone Hill       | J. V. Evans  | Planet. Space Sci. <u>23</u> , 1611 (1975), DDC AD-A024239               |
| 4494 | A Review of F Region Dynamics  | J. V. Evans  | Revs. Geophys. Space Phys. <u>13</u> , 887 (1975)                        |
| 4495 | Instrumentation for Conformable Photomask Lithography                              | J. Melngailis<br>H. I. Smith<br>N. Efremow                 | IEEE Trans. Electron Devices <u>ED-22</u> , 496 (1975), DDC AD-A016600/4 |
| 4498 | PbS MIS Devices for Charge-Coupled Infrared Imaging Applications                   | F. J. Leonberger<br>A. L. McWhorter<br>T. C. Harman        | Appl. Phys. Lett. <u>26</u> , 704 (1975), DDC AD-A016704/9               |
| 4501 | A Transistor Design for High $f_T$ at Low Currents                                 | P. Greiff  | Accepted IEEE Trans. Electron Devices                                    |
| 4502 | Crystal Structure of $\text{NdLiP}_4\text{O}_{12}$                                 | H. Y-P. Hong   | Mater. Res. Bull. <u>10</u> , 635 (1975), DDC AD-A016702/3               |
| 4503 | Integrated GaAs-AlGaAs Double-Heterostructure Lasers                               | C. E. Hurwitz<br>J. A. Rossi<br>J. J. Hsieh<br>C. M. Wolfe | Appl. Phys. Lett. <u>27</u> , 241 (1975), DDC AD-A016699/1               |

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| 4506 | Silicon- and Selenium-Ion-Implanted GaAs Reproducibly Annealed at Temperatures up to 950°C                 | J. P. Donnelly<br>W. T. Lindley<br>C. E. Hurwitz        | Appl. Phys. Lett. <b>27</b> , 41 (1975),<br>DDC AD-A016690/0     |
| 4507 | Elevation Stepping of Gimballed Devices on Rotor-Stabilized Spacecraft                                     | G. J. Cloutier  | J. Spacecraft <b>12</b> , 511 (1975),<br>DDC AD-A024189          |
| 4508 | Electrical Characterization of Epitaxial Layers  | G. E. Stillman<br>C. M. Wolfe                           | Accepted Thin Solid Films  |
| 4509 | As <sup>+</sup> -Ion Implanted Lead Telluride p-n Junction Photodiodes                                     | J. P. Donnelly<br>T. C. Harman                          | Solid-State Electron. <b>18</b> , 1144 (1975),<br>DDC AD-A024246 |
| 4511 | Crystallization of Amorphous Silicon Films by Nd:YAG Laser Heating   | J. C. C. Fan<br>H. J. Zeiger                            | Appl. Phys. Lett. <b>27</b> , 224 (1975),<br>DDC AD-A016696/7    |
| 4517 | Modes of Crossed Rectangular Waveguide   | H. J. Stalzer, Jr.<br>M. D. Greenman<br>F. G. Willwerth | Accepted IEEE Trans. Antennas Propag.                            |
| 4518 | Resonances of a Two-Degree-of-Freedom System on a Spin-Stabilized Spacecraft                               | G. J. Cloutier  | Accepted J. Spacecraft   |
| 4519 | High-Resolution Methane $\nu_3$ -Band Spectra Using a Stabilized Tunable Difference-Frequency Laser System | A. S. Pine  | Accepted J. Opt. Soc. Am.  |
| 4521 | Optically Pumped 16- $\mu$ m CO <sub>2</sub> Laser   | R. M. Osgood, Jr.                                       | Accepted Appl. Phys. Lett.                                       |
| 4524 | Coherent Integration and Correlation in a Modified Acousto-electric Memory Correlator                      | K. A. Ingebrigtsen<br>E. Stern                          | Appl. Phys. Lett. <b>27</b> , 170 (1975),<br>DDC AD-A016688/4    |
| 4525 | Thermal-Blooming Compensation: Experimental Observations Using a Deformable-Mirror System                  | C. A. Primmerman<br>D. G. Fouche                        | Accepted Appl. Opt.  |
| 4526 | Comments on "Radar-Range Equation"   | A. J. Simmons   | Proc. IEEE <b>63</b> , 1722 (1975),<br>DDC AD-A024184            |
| 4527 | Reflection and Transmission Characteristics of Thin, Periodic Interfaces                                   | J. T. Mayhan<br>L. T. Tsai                              | Accepted IEEE Trans. Antennas Propag.                            |
| 4528 | Application of Moiré Techniques in Scanning-Electron-Beam Lithography and Microscopy                       | H. I. Smith<br>S. R. Chinn<br>P. D. DeGraff             | J. Vac. Sci. Technol. <b>12</b> , 1262 (1975),<br>DDC AD-A024183 |
| 4530 | Comments on "Radar-Range Equation"   | J. J. G. McCue  | Proc. IEEE <b>63</b> , 1722 (1975),<br>DDC AD-A024184            |

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| 4531 | Optically Pumped Infrared V-V Transfer Lasers  | H. Kildal<br>T. F. Deutsch  | Appl. Phys. Lett. <u>27</u> , 500 (1975),<br>DDC AD-A024185   |
| 4532 | Prospects for X-Ray Fabrication of Si IC Devices   | H. I. Smith<br>S. E. Bernacki                                       | J. Vac. Sci. Technol. <u>12</u> , 1321 (1975), DDC AD-A024188 |
| 4533 | High-Power Radar Studies of the Ionosphere   | J. V. Evans   | Proc. IEEE <u>63</u> , 1636 (1975),<br>DDC AD-A024232         |
| 4534 | Moment Tensor Representation of Surface Wave Sources   | D. W. McCowan   | Accepted Geophys. J. R. Astr. Soc.                            |
| 4537 | Photoelectrolysis of Water in Cells with $\text{TiO}_2$ Anodes   | J. G. Mavroides<br>D. I. Tchernev<br>J. A. Kafalas<br>D. F. Kolesar | Mater. Res. Bull. <u>10</u> , 1023 (1975), DDC AD-A017419/3   |
| 4538 | A New Principle for Fast Fourier Transformation  | C. M. Rader<br>N. M. Brenner  | Accepted IEEE Trans. Acoust., Speech, and Signal Processing   |
| 4539 | On the Interpretation of Infrared Modulation Spectroscopy Data in Graphite by the Slonczewski-Weiss-McClure Band Model | M. S. Dresselhaus<br>G. Dresselhaus                                 | Accepted Phys. Rev. B   |
| 4540 | Output Coupling for Closely Confined $\text{Pb}_{1-x}\text{Sn}_x\text{Te}$ Double-Heterostructure Lasers               | R. W. Davies<br>J. N. Walpole                                       | Accepted IEEE J. Quantum Electron.                            |
| 4541 | CW Laser Action in Acentric $\text{NdAl}_3(\text{BO}_3)_4$ and $\text{KNdP}_4\text{O}_{12}$                            | S. R. Chinn<br>H. Y-P. Hong   | Opt. Commun. <u>15</u> , 345 (1975),<br>DDC AD-A024235        |
| 4542 | The Frequency of Very Large Earthquakes  | M. A. Chinnery<br>R. G. North                                       | Science <u>190</u> , 1197 (1975),<br>DDC AD-A024236           |
| 4543 | Crystal Structure of Potassium Neodymium Metaphosphate, $\text{KNdP}_4\text{O}_{12}$ , A New Acentric Laser Material   | H. Y-P. Hong  | Mater. Res. Bull. <u>10</u> , 1105 (1975), DDC AD-A017268/4   |
| 4545 | Spiking Oscillations in Diode-Pumped $\text{NdP}_5\text{O}_{14}$ and $\text{NdAl}_3(\text{BO}_3)_4$ Lasers             | S. R. Chinn<br>H. Y-P. Hong<br>J. W. Pierce                         | Accepted IEEE J. Quantum Electron.                            |
| 4547 | Isotope Separation Involving Photoinduced Changes in the Electric and Magnetic Properties of Molecules and Atoms       | P. L. Kelley<br>N. M. Kroll<br>C. K. Rhodes                         | Accepted Opt. Commun.   |
| 4551 | The Submarine-Towed ELF Loop Antenna   | M. L. Burrows   | Accepted Radio Sci.   |
| 4552 | Inhomogeneous Broadening of the Lyman-Series Absorption of Simple Hydrogenic Donors                                    | D. M. Larsen  | Accepted Phys. Rev. B   |
| 4553 | Photoelectrolysis of Water in Cells with $\text{SrTiO}_3$ Anodes   | J. G. Mavroides<br>J. A. Kafalas<br>D. F. Kolesar                   | Accepted Appl. Phys. Lett.                                    |

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| 4554  | Room-Temperature Operation of GaInAsP/InP Double-Heterostructure Diode Lasers Emitting at 1.1 $\mu\text{m}$               | J. J. Hsieh  | Accepted Appl. Phys. Lett.             |
| 4555A | Transparent Heat Mirrors for Solar-Energy Applications  | J. C. C. Fan<br>F. J. Bachner                              | Accepted Appl. Opt.                    |
| 4557  | Lattice Dynamics of Transition Metals in the Resonance Model  | B. A. Oli<br>A. O. E. Animalu                              | Accepted Phys. Rev. B                  |
| 4561  | Fabrication of Silicon MOS Devices Using X-Ray Lithography  | S. E. Bernacki<br>H. I. Smith                              | Accepted Nikkei Electronics            |
| 4562  | More $A_1E + EA_2 = -D$ and $X = A_1X + XA_2 + D$ , $X(0) = C$  | R. T. Lacoss<br>A. F. Shakal                               | Accepted IEEE Trans. Automatic Control |
| 4563  | Observation of Excitonic Surface States on MgO - Stark-Model Interpretation   | V. E. Henrich<br>G. Dresselhaus<br>H. J. Zeiger            | Accepted Phys. Rev. Lett.              |
| 4566  | Crystal Structures and Crystal Chemistry in the System $\text{Na}_{1+x}\text{Zr}_2\text{Si}_x\text{P}_{3-x}\text{O}_{12}$ | H. Y-P. Hong   | Accepted Mater. Res. Bull.             |
| 4567  | Thin-Film Conducting Microgrids as Transparent Heat Mirrors   | J. C. C. Fan<br>F. J. Bachner<br>R. A. Murphy              | Accepted Appl. Phys. Lett.             |
| 4568  | Sustainer Enhancement of the VUV Fluorescence in High-Pressure Xenon  | E. E. Huber<br>L. R. Jones<br>E. V. George<br>R. M. Lerner | Accepted IEEE J. Quantum Electron.     |
| 4569  | Fast $\text{Na}^+$ -Ion Transport in Skeleton Structures  | J. B. Goodenough<br>H. Y-P. Hong<br>J. A. Kafalas          | Accepted Mater. Res. Bull.             |
| 4570  | Thermal Faceting of (110) and (111) Surfaces of MgO   | V. E. Henrich  | Accepted Surf. Sci.                    |
| 4573  | Acoustoelectric Convolvers for Programmable Matched Filtering in Spread-Spectrum Systems                                  | J. H. Cafarella<br>W. M. Brown<br>E. Stern<br>J. A. Alusow | Accepted Proc. IEEE                    |
| 4574  | The Schottky Diode Acoustoelectric Memory and Correlator, A Novel Programmable Signal Processor                           | K. A. Ingebrigtsen   | Accepted Proc. IEEE                    |
| 4576  | Vibrational Energy Relaxation in Liquid $\text{N}_2$ -CO Mixtures   | S. R. J. Brueck<br>R. M. Osgood                            | Accepted Chem. Phys. Lett.             |
| 4578  | Three-Dimensional Seismic Structure of the Lithosphere under Montana LASA   | K. Aki<br>A. Christofferson<br>E. S. Husebye               | Accepted Bull. Seismol. Soc. Am.       |

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| 4581 | Surface Acoustic Wave Resonators  | D. T. Bell<br>R. C. M. Li                    | Accepted Proc. IEEE                |
| 4583 | Properties and Applications of Reflective-Array Devices   | R. C. Williamson                             | Accepted Proc. IEEE                |
| 4584 | Room-Temperature, cw Operation of GaInAsP/InP Double-Heterostructure Diode Lasers Emitting at 1.1 $\mu\text{m}$ | J. J. Hsieh<br>J. A. Rossi<br>J. P. Donnelly | Accepted Appl. Phys. Lett.         |
| 4585 | Infrared Third Harmonic Generation in Molecular Gases   | H. Kildal<br>T. F. Deutsch                   | Accepted IEEE J. Quantum Electron. |
| 4595 | Large-Spot Thermal Coupling of CO <sub>2</sub> Laser Radiation to Metallic Furnaces                             | S. Marcus<br>J. Lowder<br>D. Mooney          | Accepted J. Appl. Phys.            |

# MEETING SPEECHES

## MS No.

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| 2951F | Some Comparisons of Fluorides, Oxides and Sulfides Containing Divalent Transition Elements | J. B. Goodenough                                   | <u>In Solid State Chemistry</u> , C. N. R. Rao, Ed. (Dekker, New York, 1974)  |
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